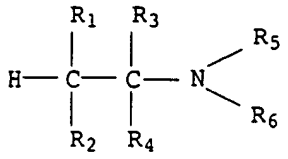
We claim:

1. A process for the preparation of polyalkeneamines of the formula (I)

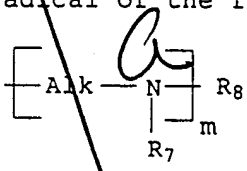


(I)

where

R_1, R_2, R_3 and R_4, independently of one another, are each hydrogen or an unsubstituted or substituted, saturated or mono- or polyunsaturated aliphatic radical having a number-average molecular weight of up to about 40000, at least one of the radicals R_1 to R_4 having a number average molecular weight of from about 150 to about 40000, and

R_5 and R_6, independently of one another, are each hydrogen, alkyl, cycloalkyl, hydroxyalkyl, aminoalkyl, alkenyl, alkynyl, aryl, arylalkyl, alkylaryl, hetaryl or an alkyleneimine radical of the formula (II)



(II)

where

Alk is straight-chain or branched alkylene,

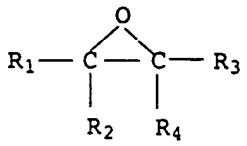
m is an integer from 0 to 10, and

R_7 and R_8, independently of one another, are each hydrogen, alkyl, cycloalkyl, hydroxyalkyl, aminoalkyl, alkenyl, alkynyl, aryl, arylalkyl, alkylaryl or hetaryl or, together with the nitrogen atom to which they are bonded, form a heterocyclic structure,

or R_5 and R_6, together with the nitrogen atom to which they are bonded, form a heterocyclic structure, it being possible for each of the radicals R_5, R_6, R_7 and R_8 to be substituted by further alkyl radicals carrying hydroxyl or amino groups,

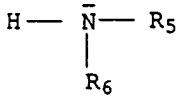
wherein

an epoxide of the formula (IV)

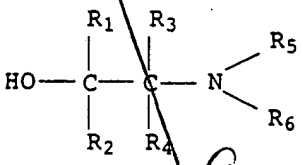


(IV)

where R_1, R_2, R_3 and R_4 have the abovementioned meanings, is reacted with a nitrogen compound of the formula (V)



where R_5 and R_6 have the abovementioned meanings, to give the amino alcohol of the formula (VI)



(VI)

the amino alcohol of the formula (VI) is catalytically dehydrated and the olefin formed is hydrogenated to give the amine of the formula (I).

2. A process as claimed in claim 1, wherein the epoxide of the formula (IV) is reacted with the nitrogen compound of the formula (V) in the presence of hydrogen and of a catalyst which has dehydrating and at the same time hydrogenating properties.

3. A process as claimed in claim 1, wherein the epoxide of the formula (IV) is first reacted with the nitrogen compound of the formula (V) in the presence of an alkoxylation catalyst to give the amino alcohol of the formula (VI) and, if required, unconverted reactants are separated off, and the amino alcohol (VI) is then hydrogenated in the presence of a catalyst which has dehydrating and at the same time hydrogenating properties.

4. A process as claimed in claim 2 or 3, wherein the catalyst having dehydrating and hydrogenating properties is selected from zeolites or porous oxides of Al, Si, Ti, Zr, Nb, Mg or

Zn, acidic ion exchangers and heteropolyacids, each of which carries at least one hydrogenation metal.

5. A process as claimed in claim 4, wherein the hydrogenation metal is selected from Ni, Co, Cu, Fe, Pd, Pt, Ru, Rh and combinations thereof.

6. A process as claimed in claim 5, wherein the catalyst (catalytically active material) contains about 30 % by weight, calculated as ZrO_2, of a zirconium compound, about 50 % by weight, calculated as NiO, of a nickel compound and about 18 % by weight, calculated as CuO, of a copper compound.

7. A process as claimed in any of the preceding claims, wherein the nitrogen compound and epoxide are used in a molar ratio of from about 1:1 to about 40:1.

8. A process as claimed in any of the preceding claims, wherein the reaction temperature is from about 80 to 250°C.

9. A process as claimed in any of the preceding claims, wherein a hydrogen pressure of up to about 600 bar is established.

10. A process as claimed in any of the preceding claims, wherein an epoxide of the formula (IV), where one of the radicals R_1 to R_4 has a number average molecular weight of from about 150 to 40000, is used.

11. A process as claimed in claim 10, wherein the epoxide is derived from a polyalkene which is a homo- or copolymer of C_2-C_{30}-alkenes.

12. A process as claimed in claim 11, wherein the polyalkene is derived from at least one 1-alkene, selected from ethylene, propylene, 1-butene and isobutene.

13. A process as claimed in any of the preceding claims, wherein the nitrogen compound of the formula (V) is selected from NH_3, monoalkylamines, dialkylamines and alkylenediamines having at least one primary or secondary amino group.

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